

# Provision of continual support to farmers, village boar keepers and providers of artificial insemination (AI) services trained at the villages in northwest Vietnam under the Li-Chan project

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# Introduction

This training report relates to strengthening pig and cattle artificial insemination in the Son La province of northwest Vietnam, under the 'Livestock-led interventions towards equitable livelihoods and improved environment in the North-West Highlands of Vietnam (Li-Chan)' project (<https://livestock.cgiar.org/countries/vietnam>).

The project initially supported training of: livestock keepers and other stakeholders on pig and cattle breeds, breeding and artificial insemination (AI, <https://hdl.handle.net/10568/113266>); animal health-workers in cattle artificial insemination (with those trained certified as cattle AI service providers, <https://hdl.handle.net/10568/113267>); sow and boar keepers in pig artificial insemination (<https://hdl.handle.net/10568/113268>); as well as Ban boar keepers on production of semen from these boars for use in AI (<https://hdl.handle.net/10568/113265>).

This report details follow-up activities to this initial training, involving support to those trained in cattle and pig artificial insemination service provision, as well as support to smallholder livestock keepers that wanted to adopt cattle or pig AI. Priority was given to the Li-Chan study villages (which are Mon 1, Mon 2, Oi, and Buom Khoang in the Chiềng Luong commune, and Khoa and Xam Ta in Chiềng Chung commune) and other surrounding villages where demand for cattle and pig AI was high.

# Overview of follow-on support

## AI on cattle

In December 2020, the team of experts from the National Institute of Animal Sciences (NIAS) observed the body conditions of about 100 cows in households in all study villages and surrounding areas. Only 62 cows had body conditions good enough for further examination of the reproductive tract for the application of AI. After the examinations, 14 out of 37 cows in Ban Mon 1, Mon 2, and Ban Mat villages (Chieng Luong commune), and 12 out of 25 cows in Khoa and Ham villages (Chieng Chung commune) were selected to be synchronized and then inseminated. The other cows displayed genital inflammation, had inactive ovaries, and/or were under poor nutrition, and thus did not meet the standards for application of AI (see Annex 1 for the list of households where cows were examined).

For the cows with reproductive tract problems, the expert team informed the head of the household and the local veterinarians on the disease status of each animal and the ways to treat the animals. However, the treatment of reproductive diseases in the villages has not been done so far. It is necessary to have the help of professional veterinarian to guide the implementation of reproductive disease management.

In total, 26 cows were inseminated (following synchronization) on 23 December 2021, including 12 in Chiềng Lương and 14 in Chiềng Chung. After about 40–50 days, 4 cows in Chieng Luong commune and 3 cows in Chieng Chung commune were in heat again, however, due to the Tet holidays and the COVID-19-related lockdown, the re-insemination was not implemented until early April 2021 when all cows were checked for pregnancy. The households with inseminated cows were also given guidance on feeding and managing the pregnant animals.

Among 26 inseminated cows, 14 cows were pregnant (54%), and 4 cows re-inseminated in April (details in Annex 2).

Three (all male) communal and village vet workers of the Chieng Chung commune and three (1 female, two males) communal and village vet workers from the Chieng Luong commune have been operating successfully wish to continue providing AI services in the future. In addition, another person (male) from the Hmong Xam Ta village has been actively inseminating cattle.

Some pictures from the field



Guiding communal and village vets to examine and perform AI on cows.



F1 of Brahman x local cow from AI



Cow with calf that was conceived via AI (28 September 2021)



Cow with calf that was conceived via AI (23 September 2021).



Cow with calf that was conceived via AI (23 September 2021).

## AI on pigs

Farmers in the study villages who wanted to apply AI on their pigs registered with the project and the team of experts visited the farms to get information of the sows (breeds, age, farrowing, heat cycle and body condition).

During three periods in January, April to May, and June to July 2021, support on pig artificial insemination was offered to 49 households of the study villages Mon 1, Mon 2, Oi (Chieng Luong commune) and Khoa (Chieng Chung commune), which collectively had 56 sows. The supports type and the conception rates were different across these periods, as follows.

### *1. The first support period (January 2021):*

The data on the status of the local sows from the households that wanted to adopt AI for their sows were collected and examined. Synchronization was performed for groups of 5 to 6 sows from households located near each other. A group of 3 to 5 farmers and local vet workers were present to see the inseminations

performed by trainers for the first semen dose in the morning, and then practiced by themselves under the guidance of the trainers in the afternoon for the second semen doses. A total of 21 sows (2 crossbred sows and 19 local sows) from Oi village, Mon 1, and Khoa were inseminated; 1 sow was sold after AI; 11 sows were pregnant (conception rate of 55%). Four of the farmers (2 men from the Khoa and Oi villages, and two women from the Oi and Mon 1 villages) continuously performed successful self-AI for their sows in June and July for the next litter (see more detail in Annex 3).

### 2. The second support period (April and May 2021):

Similar to the first period, artificial insemination support for local sows was implemented on 20 sows of 18 households. In this period, the farmers and local vet performed AI under the guidance of the trainers, with any problems relating to performing the AI discussed at that time. In this period, the conception rate was only 30% with two repetitions (3 doses) (see Annex 4). The low conception rate may be due to several reasons such as: some sows were not yet ready for insemination after delivery; the hot weather (high temperature); African swine fever occurred in Mon 1 and Mon 2 at the end of Jan – Feb 2021 and the long period of performing AI on a sow, and it being done by more than two persons.

### 3. The third support period (June and July 2021):

The third support period was during the COVID-19 lockdown in Hanoi and Son La and thus could not involve in-person visits. Village and communal veterinary workers were given guidance on AI and linked to semen sources via phone calls with the trainers. Farmers communicated with the vet workers on heat signs and the right time for insemination of their sows. These sows were then inseminated by the farmers (self-AI using semen from a supplier in Mai Son). A total of 14 farmers performed self-AI for their sows and all were successful (Annex 5).

Some other farmers also did AI for their sows by themselves but these have not yet been listed.

*A photovoice done by Mr. Ha Van Chung, a farmer in Khoa village, Chieng Chung commune:*

<https://www.facebook.com/ilriinvietnam/photos/a.542832636238209/1183602215494578/>



Photo credit: Ha Van Chung

‘This is my family's sow, a local breed of pig that is raised by many villagers. At the moment, there are few local boars in the village, which poses the risk of inbreeding. As such, we have applied artificial insemination (AI). After receiving training from Lichan project, I am very confident at my AI skills. And the sow just gave birth to 15 piglets.’

**Two local boar keepers (both male)** in Khoa village applied AI successfully for four sows of other households using semen collected from their boars.

### **Initial extension to a neighbouring district**

In **addition** a private veterinarian (male and Thai ethnic), who participated in the training courses and played a role as a field assistant, has already successfully performed AI in the neighbouring Yen Chau district (where he is living) for 15 sows (6 local and 9 crossbreed sows).

### Some remarks on pig AI support

Both women and men participated and operated AI on pigs quite well (for example, a female village boar keeper from Mon I ; a female communal vet from Oi village; a male village boar keeper from Khoa village, and a male communal vet for Chieng Chung).

On the number of piglets/ litter there were about 50% with 10–12 piglets, 46% with 4–6 piglets or 14–15 piglets. There was 1 sow with only 1 piglet born alive (5 abnormal piglets), and 1 sow aborted before delivery (4%).

Some difficulties in performing AI at the villages for Ban pigs were noted as follows:

- Large area, far distance from one household to another.
- Large stable and several pigs are kept together, while the behaviour of some Ban sows is wild making the pigs difficult to access.
- The signals of heat of some Ban sows were not as clear as on exotic pigs.
- Farmers do not record the reproduction of the sows, thus are not sure about their heat cycles and farrowing status
- Due to African swine fever, the number of sows was markedly decreased

It is noted that the training and guiding for farmers on building pig housing (stables), care for pregnant sows, how to take care of lactating sows and new born piglets, and how to detect and treat **some common diseases on sows and piglets was still needed along with training and support on AI for full performance improvement.** After adopting AI for local sows with Duroc's semen, many farmers recognized that piglets look nicer, with black colour, have more lean meat rate (meeting the consumer preference and market demand) and were faster growing. They asked the project staff for the reason and where to buy Duroc's semen. They also noticed the decrease in abnormal piglet numbers when using semen from outside boars.

### Some pictures from the field





Guiding and practicing AI on local sows



Pregnant sows



Piglets born from AI application

# Annexes

## Annex I: List of households with cows examined and performed AI

In Chieng Luong commune

Household	Village-commune	Status	AI performed
1	Mờn- Chiềng Lương	5th calving, calving 3 months ago, normal reproduction	x
2	Mờn- Chiềng Lương	2nd calving, calving 5 months ago, normal reproduction; the corpus luteum on the right side	x
3	Mờn- Chiềng Lương	2nd calving, inactive ovary	
4	Mờn- Chiềng Lương	1st calving, inactive ovaries, cervicitis	
5	Mờn- Chiềng Lương	Heifer, cervicitis	
6	Mờn- Chiềng Lương	8th calving, inactive ovaries, cervicitis	
7	Mờn- Chiềng Lương	3rd calving, inactive ovaries	x
8	Mờn- Chiềng Lương	1st calving, poor nutrition	
9	Mờn- Chiềng Lương	2nd calving, cervicitis at the two half outside	
10	Mờn- Chiềng Lương	First calving, the corpus luteum, pregnant?	
11	Mờn- Chiềng Lương	3rd calving, calving 8 months ago, normal reproduction	x
12	Mờn- Chiềng Lương	4th calving, calving 5 months ago, normal reproduction	x
13	Mờn- Chiềng Lương	3 <sup>rd</sup> calving, calving 4 months ago, normal reproduction	x
14	Mờn- Chiềng Lương	4 <sup>th</sup> calving, calving 7 months ago, normal reproduction	x
15	Mờn- Chiềng Lương	Cervicitis	
16	Mờn- Chiềng Lương	Cervicitis	
17	Mờn- Chiềng Lương	3 <sup>rd</sup> calving, inactive ovaries, cervicitis	
18	Mờn- Chiềng Lương	Cervicitis	
19	Mờn- Chiềng Lương	4 <sup>th</sup> calving, inactive ovaries, cervicitis	
20	Mờn- Chiềng Lương	Cervicitis	
21	Mờn- Chiềng Lương	3 <sup>rd</sup> calving, inactive ovaries, cervicitis	
22	Mờn- Chiềng Lương	Cervicitis	
23	Mật- Chiềng Lương	1 <sup>st</sup> calving, normal	x
24	Mật- Chiềng Lương	Cervicitis, 2 <sup>nd</sup> calving	
25	Mật- Chiềng Lương	Cervicitis, 3 <sup>rd</sup> calving	
26	Mật- Chiềng Lương	In heat ?	
27	Mật- Chiềng Lương	Heifer, normal	x
28	Mật- Chiềng Lương	3 <sup>rd</sup> calving, normal	x

29	Mật- Chiềng Lương	2 <sup>nd</sup> calving, normal	x
30	Mật- Chiềng Lương	Heifer, normal reproduction	x
31	Mật- Chiềng Lương	3 <sup>rd</sup> calving, normal	x
32	Mật- Chiềng Lương	Normal	x
33	Mật- Chiềng Lương	Cervicitis	
34	Mật- Chiềng Lương	Cervicitis	
35	Mật- Chiềng Lương	Cervicitis, 3 <sup>rd</sup> calving	
36	Mật- Chiềng Lương	4 <sup>th</sup> calving, pregame of 4 months	
37	Mật- Chiềng Lương	Cervicitis, 3 <sup>rd</sup> calving	

#### In Chieng Chung commune

Household	Village-commune	Status	AI
1	Khoa- Chieng Chung	1 <sup>st</sup> calving, calving 7 months ago, small ovary	x
2	Khoa- Chieng Chung	3 <sup>rd</sup> calving, normal	x
3	Khoa- Chieng Chung	1 <sup>st</sup> calving, small ovary	x
4	Khoa- Chieng Chung	Cervicitis, 2 <sup>nd</sup> calving	
5	Khoa- Chieng Chung	Cervicitis	
6	Khoa- Chieng Chung	Cervicitis	
7	Khoa- Chieng Chung	2 <sup>nd</sup> calving, normal	
8	Khoa- Chieng Chung	2 <sup>nd</sup> calving, normal	x
9	Khoa- Chieng Chung	1 <sup>st</sup> calving, normal	x
10	Khoa- Chieng Chung	3 <sup>rd</sup> calving, normal	x
11	Khoa- Chieng Chung	3 <sup>rd</sup> calving, normal	x
12	Khoa- Chieng Chung	1 <sup>st</sup> calving, right ovarian cysts	
13	Khoa- Chieng Chung	cervicitis	
14	Khoa- Chieng Chung	Lứa 5, sinh sản bình thường	x
15	Khoa- Chieng Chung	cervicitis	
16	Khoa- Chieng Chung	Lứa 2, bình thường	x
17	Khoa- Chieng Chung	Lứa 2, bình thường	x
18	Khoa- Chieng Chung	Lứa 4, bình thường	x
19	Khoa- Chieng Chung	Lứa 1, nang phải	x

## Annex 2: Cows of household that have been inseminated successfully

In Chieng Chung and Chieng Luong communes

Household	Village- commune	Date of AI		Re inseminated
1	Mờn- Chiềng Lương	13/12/2020		
2	Mờn- Chiềng Lương	13/12/2020		
3	Mờn- Chiềng Lương	13/12/2020		
4	Mờn- Chiềng Lương	13/12/2020		
5	Mờn- Chiềng Lương	13/12/2020		
6	Khoa -Chiềng Chung	13/12/2020		13/4/2021
7	Khoa -Chiềng Chung	13/12/2020		
8	Khoa -Chiềng Chung	13/12/2020		13/4/2021
9	Khoa -Chiềng Chung	13/12/2020		13/4/2021
10	Khoa -Chiềng Chung	13/12/2020		
11	Khoa -Chiềng Chung	13/12/2020		
12	Khoa -Chiềng Chung	13/12/2020		
13	Khoa -Chiềng Chung	13/12/2021		13/4/2022
14	Khoa -Chiềng Chung	13/12/2022		

## Annex 3: Synchronized AI adoption in January 2021 (divided into 3 groups of synchronization; 1 sow/household)

In Chieng Chung and Chieng Luong communes

Household	Village- commune	AI adoption sucessfully, no. of piglets	AI adoption for the next litter
1	Khoa – Chieng Chung		
2	Khoa – Chieng Chung		
3	Khoa – Chieng Chung		
4	Khoa – Chieng Chung	10	
5	Khoa – Chieng Chung	14	
6	Khoa – Chieng Chung	4	
7	Khoa – Chieng Chung	11	x
8	Khoa – Chieng Chung	Sold after AI	
9	Khoa – Chieng Chung		
10	Khoa – Chieng Chung		
11	Oi – Chieng Luong		
12	Oi – Chieng Luong	6	
13	Oi – Chieng Luong	11	x
14	Oi – Chieng Luong	5	
15	Oi – Chieng Luong	x	
16	Oi – Chieng Luong	x	
17	Oi – Chieng Luong		
18	Oi – Chieng Luong	15	x
19	Oi – Chieng Luong		
20	Oi – Chieng Luong		
21	Mờn 1 – Chieng Luong	6	x

## Annex 4: Synchronized AI adoption in April and May 2021 (divided into 3 groups of synchronization)

In Chieng Chung and Chieng Luong communes

Household	Village-commune	No. of sows	Successful with repeated AI
1	Mờn 1 – Chieng Luong	1	
2	Mờn 1 – Chieng Luong	1	
3	Mờn 1 – Chieng Luong	1	
4	Mờn 1 – Chieng Luong	1	
5	Oi – Chieng Luong	1	
6	Oi – Chieng Luong	1	
7	Mờn 1 – Chieng Luong	2	2 sows
8	Mờn 1 – Chieng Luong	1	
9	Mờn 2 – Chieng Luong	1	
10	Mờn 2 – Chieng Luong	2	2 sows
11	Khoa – Chieng Chung	1	
12	Khoa – Chieng Chung	1	
13	Khoa – Chieng Chung	1	
14	Khoa – Chieng Chung	1	
15	Khoa – Chieng Chung	1	
16	Khoa – Chieng Chung	1	
17	Khoa – Chieng Chung	1	
18	Khoa – Chieng Chung	1	

## Annex 5: Farmers who performed AI for their sows successfully by themselves with indirect guidance from vets

In Chieng Chung and Chieng Luong communes

Household	Village-commune
1	Mờn 2 – Chieng Luong
2	Mờn 1 – Chieng Luong
3	Oi – Chieng Luong
4	Khoa – Chiêng Chung
5	Khoa – Chiêng Chung
6	Khoa – Chiêng Chung
7	Khoa – Chiêng Chung
8	Khoa – Chiêng Chung
9	Khoa – Chiêng Chung
10	Khoa – Chiêng Chung
11	Khoa – Chiêng Chung
12	Oi – Chieng Luong
13	Oi – Chieng Luong
14	Mon 1 – Chieng Luong